Palindromic Bookcase (bookcase)

Antonio, a computer science student, has a huge collection of books. His bookcase has a strange structure, resembling a graph: it is formed by nodes (each node can contain just one book) and edges (bidirectional connections between the nodes), there are no cycles in this graph, and from any book to any other book there is always exactly one possible path.

Figure 1: Antonio's bookcase without books.

A few days ago, while Antonio was in Milan for his friend Nicole's graduation, his mom decided to take out all the books from his bookcase to clean it. Once cleaned, she forgot what order the books where in. Fortunately, Antonio doesn't really care about the order, as long as Q rules are followed. Each rule states two books X and Y that Antonio particularly likes and relates to one another: the rule requires that when looking at the first letter of every book on the path from book X to book Y, the resulting string must must compose a palindrome string.

It's obvious, after all: who would want to go from "The Lord of the Rings" through many other books until finally reaching "The Hobbit" without the pleasure of looking at a palindrome sequence of letters?

Verifying that the bookcase respects the Q rules is not a very difficult task, however Antonio's mom has a lot of things to do. So, help her in testing the Q different paths!

Input

The first line contains two integers N and M, respectively the number of books (i.e. nodes) of the bookcase and the number of edges (i.e. bidirectional connections).

The second line contains N characters: the i_{th} character is the first letter of the i_{th} book.

Each of the next M lines contain two integers: A_i and B_i, indicating that there is a bidirectional connection between the node A_i and the node B_i.

The next line contains an integer Q, the number of rules that Antonio's mom wants to verify.

Each of the next Q lines contain two integers: X_i and Y_i, which indicate the path of the tree for which Antonio's mom wants to test the palindromic property.

Output

You need to write Q lines containing each the result of the i_{th} query. For each query, if the path from X_i to Y_i produces a palindrome string write `YES`, if not, write `NO`.

Constraints

- $2 \leq N, Q \leq 100\,000$.
- $M = N - 1$.
- The first letter of each book is always represented by a lowercase letter of the English alphabet.

- $0 \leq A_i, B_i \leq N-1$ for $i = 1 \ldots M$. There are no self-loops in the graph so $A_i \neq B_i$. There is also at most one single edge between two same nodes.
- $0 \leq X_i, Y_i \leq N-1$ for $i = 1 \ldots Q$. Every rule to verify spans at least two books (otherwise it would obviously be verified) so $X_i \neq Y_i$.

Examples

input	output
6 5 a b b e a f 0 1 0 2 0 3 2 4 3 5 2 0 4 0 5	YES NO
6 5 a c d a c f 0 1 0 2 1 4 2 3 3 5 2 0 4 0 5	NO NO
3 2 b c b 1 2 0 1 1 0 2	YES